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Shaw University-University of North Carolina at Chapel Hill Undergraduate  
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PRINCIPAL INVESTIGATOR:  
Paul A. Godley  
Daniel L. Howard

CONTRACTING ORGANIZATION:  
University of North Carolina  
Chapel Hill, NC 27599-1350

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14. ABSTRACT The Shaw-UNC Undergraduate Program in Prostate Cancer Research and Training (SUUPRT) is a collaborative project between the University of North Carolina at Chapel Hill (UNC-CH), and Shaw University, the oldest Historically Black College/University in the South. SUUPRT provides research and academic training to prepare young men and women of color to become tomorrow's prostate cancer researchers and public health professionals. The first year of the SUUPRT has been highly successful. A broad ranging training program has been implemented which introduces students to the biological, behavioral, environmental and nutritional factors that may contribute to the high incidence and mortality of prostate cancer among African Americans, provides them with opportunities to carry out research in one of these areas, and informs them regarding careers in prostate cancer research. Four highly qualified students participated in Year 1, and two of these students have now entered graduate school in the biological sciences. Another student will return for a second year in the SUUPRT Program. Exit surveys of the students indicate that the program increases student interest					
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# **INTRODUCTION**

The Shaw-UNC Undergraduate Program in Prostate Cancer Research and Training (SUUPPRT) is a collaborative project between the University of North Carolina at Chapel Hill (UNC-CH), a Research I university renowned for its multidisciplinary approach to cancer research, and Shaw University, the oldest Historically Black College/University in the South. SUUPPRT provides research and academic training to prepare young men and women of color to become tomorrow's prostate cancer researchers and public health professionals. Each year four promising Shaw University undergraduate students with an interest in prostate cancer research enter Year One of the SUUPPRT program, which consists of a 10 week intensive laboratory research experience at UNC-Chapel Hill, professional training, course work and seminars, followed by two semesters of further training in prostate cancer and public health research at Shaw University. Students who successfully complete this year of training may sign on for a second year, during which they will receive additional research training, participate in a GRE preparatory course, and mentor younger students. Our goal is to provide these students with the career guidance and preparation necessary to successfully matriculate to UNC-CH or other Research I universities with prostate cancer training or research programs.

## **BODY**

**This report is organized according to our original goals as outlined in the Statement of Work in the approved application.**

### **1. Recruit highly qualified students to the program**

We were quite successful in recruiting a pool of highly qualified applicants, despite a rather late start. Eight applicants meeting our criteria of GPA applied to the program; four students with the following demographics were selected from this pool.

Male: 2    Female: 2    Rising Junior : 2    Rising Senior: 2    Avg. GPA = 3.68

The two senior students had previous undergraduate research experience, but not in the area of cancer research, whereas the two junior students had no previous research experience. Three of the students had very strong backgrounds in biology and chemistry, whereas one had a strong background in computer sciences and was selected for a laboratory carrying out bioinformatics studies.

### **2. Engage students in state-of-the-art prostate cancer research through active participation in hypothesis-driven or problem-solving research projects.**

One difficulty that we encountered in the inaugural year of the program was that many of the laboratories where we tried to place students were filled by the time we contacted them in mid-April. Nevertheless, we were able to place the students in four excellent labs with prostate cancer research programs or programs that are likely to be relevant. While in these laboratories, the students participated in lab group meetings and carried out their own independent research project with the guidance of either a senior graduate student or a post-doctoral fellow.

- In the laboratory of Dr. Morgan Giddings (Department of Microbiology and Immunology and Center for Genomics), *Abdoulaie F. Lowe Nicolas* used mass spectrometry data and genome fingerprint scanning to identify proteins unique to or elevated in prostate cancer.
- In Dr. Terry Van Dyke's laboratory, *A. Taiwo Oki* studied the effect of loss of p19ARF on cell proliferation in the mouse model for prostate tumorigenesis.
- David A. Parker, working in Dr. James L. Mohler's lab, studied the affect of testosterone and a dominant negative androgen receptor on human xenograft proliferation in athymic nude mice.
- *Denise M. Wharton*, under the guidance of Dr. William Kaufmann, examined the effect of electroporation and SCR siRNA on Gamma H2AX expression in fibroblasts.

The students gave oral presentations on their projects to their peers twice during the 10-week summer program and presented posters on their work at the annual SURE/REU Summer Undergraduate Research Symposium and at a Shaw University Prostate Centers & Grants Luncheon in August 2007. In each of these venues, the students acquitted themselves well and it was apparent that they had begun to incorporate hypothesis-driven thinking into their approach to problem solving.

### **3. Introduce students to the basic scope of prostate cancer research in 3 areas; tumor biology, host factors, and public health issues.**

During their 10-week summer research program the students participated in a series of workshops on various aspects of prostate cancer research and community action, held approximately once per week. In addition, the students assisted in distributing literature and explaining the process of prostate cancer screening at the Prostate Cancer Screening Bus at a local health fair. They also attended the 14<sup>th</sup> Annual Summer Public Health Research Institute and Videoconference on Minority Health, held on June 25<sup>th</sup> at UNC-Chapel Hill.

- *Major Themes and Challenges of Prostate Cancer*, presented by Mary C. Anderson, explored risk factors, incidence, mortality, and racial disparities as well as some general areas of causation such as genetic, environmental, sociological, and cultural. Miss Anderson is Associate Director for the Shaw UNC-CH Center for Prostate Cancer Research (SUCPCR), the Shaw Johns-Hopkins Center for Prostate Cancer Research (SJHCPCR), and the Shaw UNC Undergraduate Program for Prostate Cancer Research and Training (SUUPPRT). She is also the Executive Director of the Prostate Cancer Coalition of North Carolina (PCCNC).
- *Pathology, Diagnosis and Treatment of Prostate Cancer*, presented by Dr. Paul Godley, introduced the students to prostate cancer as a clinician sees the disease and discussed issues such as tumor grading and prognosis, treatments and their side effects, disparities in treatments offered and treatments chosen by different groups of patients. Dr. Godley is a clinically active physician and epidemiologist and Director of the SUUPPRT Program.
- *The Role of the Androgen Receptor in Prostate Cancer and Androgen-Resistant Prostate Cancer* was presented by Dr. Young Wang. Dr. Wang is both a clinician and a basic researcher who studies changes in gene expression in prostate cancer at Lineberger Comprehensive Cancer Center at UNC-Chapel Hill.
- *Prostate Cancer Screening* was presented by Dr. Louie E. Ross, a chronic disease epidemiologist from the Shaw-UNC Center for Prostate Cancer Research. Dr. Ross introduced the students to the types of screening tests, and to current controversies about whether screening is effective in reducing mortality.
- *Effectively Reducing Mortality Through Community Action: A Community of Care* was presented by Dr. Sydney Barnwell, M.D., Medical Director of the Craven County Health Department. Dr. Barnwell, a pioneer in increasing prostate cancer screening and awareness in Craven County and a prostate cancer survivor, shared his experiences and insights into community outreach with the students.
- *Racial Differences in Prostate Cancer: Influence of Health Care Interaction and Host and Tumor Biology*, presented by Dr. Jeannette Bensen, introduced the students to population-based studies that seek to identify factors involved in prostate cancer incidence or aggressiveness and discussed how these differ for laboratory-based studies. Dr. Bensen is co-director of the North Carolina-Louisiana Prostate Cancer Project that is comparing social, individual, and tumor level causes of racial differences in prostate cancer aggressiveness among 1,000 Caucasians and 1,000 African Americans in North Carolina and Louisiana.
- *Expression Profiling in Cancer Research, Diagnosis and Treatment* was presented by Dr. Charles Perou, Departments of Genetics and Pathology, UNC-Chapel Hill. Dr. Perou has been at the forefront of research using expression microarrays to characterize tumor diversity, to use this information to understand more about tumor biology, and to design new clinical trials for cancer patients based upon tailored therapies.

**During the Fall 2007 and Spring 2008 Semesters the students continued their training at Shaw University through the following activities.**

- August 31, 2007, SUUPPRT students presented research posters describing their summer research results at the Shaw University Prostate Cancer Centers & Grants Luncheon.
- Fall project: The students reviewed and applied a “train-the-trainer” program developed by UsToo International (the UsToo Minority and Underserved Populations Outreach and Awareness Program) and funded by the Center for Disease Control (CDC). The program included community based research mechanisms such as pre- and post test surveys. The students applied the program over their winter holidays by educating family and acquaintances regarding prostate cancer.
- Dr. Louie Ross presented the results of two community research projects to the students: *Prayer and Self-Reported Health among Americans with a History of Cancer* and *Physician Discussions about Prostate Cancer Screening among African American Men*.
- Dr. Louie Ross conducted an interactive workshop/ discussion with the students, walking them through the community research process, from conceptualization through final analysis and publication/ presentation.
- Dr. Yhenneko Taylor gave a presentation for the students covering her work as a biostatistician at the Center for Biostatistics and Data Management at Shaw University. Her presentation dealt with general methods as well as with her work on prostate cancer screening methods.
- The SUUPPRT students attended the NC Advisory Committee meeting on Cancer Coordination and Control on April 18, 2008. The meeting is a forum where cancer research is discussed and where discussions evolve into recommendations for NC legislators to eventually translate into public policy.

**4. Introduce students to the basic molecular biology and genetic concepts necessary to understand recent advances in prostate cancer research.**

Dr. Sancar gave four lectures on introductory genetics and molecular biology and the molecular biology of the androgen receptor. Each lecture last 1.5 hours and included detailed handouts and examples relevant to prostate cancer.

**5. Inform students regarding career choices in prostate cancer research and prepare them to compete effectively for entrance into graduate school and professional schools to pursue careers in prostate cancer research.**

- Dr. Young Wang spoke to students about careers in medicine, specifically urology and oncology.
- The students toured the UNC-CH School of Public Health and learned about careers in epidemiology, biostatistics, health behavior and health education, nutrition, and health policy and management. The tour was lead by members of the Minority Student Caucus of the SPH.
- The students participated in several 50-minute workshops and panel discussions led by Dr. Sancar and designed to enhance their professional skills. These included:
  - Trust and trustworthiness in science and medicine
  - How to give a 10 minute science talk with Power Point
  - How to prepare a scientific poster
  - How to apply to graduate school
  - How to write a personal statement for graduate and medical school applications
  - Interviewing Skills

## **Key Accomplishments**

- Recruited 4 highly qualified students to the program from a pool of eight excellent applicants.
- Placed the students in top research labs on appropriate projects.
- Developed a series of seminars that inform students about many of the major issues in prostate cancer research.
- Provided guidance regarding preparing a strong application for graduate school.
- Informed students about paths to careers in prostate cancer research.
- Engaged students as active participants in community outreach work promoting prostate cancer awareness and screening
- Exit surveys indicate students felt they learned how research is carried out and were more interested in graduate or professional school (see Appendix)
- Both senior students have progressed to graduate school; one at Virginia Commonwealth University where she studies molecular biology and a second at Campbell University where he is studying for a M.S. in pharmacy.
- One junior student has returned for a second year in the SUUPPRT Program.

## **Reportable Outcomes**

- Both senior students have progressed to graduate school; one at Virginia Commonwealth University where she studies molecular biology and a second at Campbell University where he is studying for a M.S. in pharmacy.

## **Conclusions**

During its first year of operation the SUUPPRT Program has met many of its goals in terms of providing training in prostate cancer research for promising undergraduate students from Shaw University. Considering the small size of Shaw University, we have been very successful in finding qualified participants for the program. By providing training in biological research at UNC-CH and in public health research at Shaw University, we expose the students to the breadth of need and to a variety of career options they can choose from as they contribute to reducing and ultimately eliminating the scourge of prostate cancer from the African American population. During Year 2 we plan to continue the program in much the same vein as described above.

## APPENDIX I

### Composite of Evaluation of the SUUPPRT Program University of North Carolina at Chapel Hill, 2007

Participants were asked to answer each question on a scale of 1 (lowest) to 5 (highest) and to provide additional comments (in italics) when they wished. 4/4 participants responded.

#### I. Program organization and environment:

- |  |            |
|--|------------|
| 1. When you were deciding about participating in our program, was the information you received adequate?   | <u>4.0</u> |
| 2. Did you obtain information about our program in a timely manner?  | <u>2.3</u> |
| 3. Do you feel you were reasonably informed about your project before arrival?   | <u>3.3</u> |
| 4. How would you rate the Program Directors and staff in their willingness and/or effectiveness in addressing problems you may have had or in responding to any other matters? | <u>5.0</u> |
| 5. Was the amount of stipend and housing funds adequate?   | <u>5.0</u> |
| 6. Were the housing arrangements agreeable?  | <u>3.3</u> |
| 7. Please rate the following SUUPPRT activities:   |            |
| A. Orientation and tour of campus  | <u>4.0</u> |
| B. Presentations of research projects at the beginning of program  | <u>4.3</u> |
| C. Forum on Choosing and Applying to Graduate School   | <u>5.0</u> |
| D. Forum on Writing a Personal Statement and Interviewing Skills   | <u>4.7</u> |
| E. End of program Poster Session   | <u>5.0</u> |

Was there anything you particularly liked about any of these activities?

*Particularly liked the Issues in Prostate Cancer Research series.*

*I liked C and D. They made it clear about applying to graduate school and interviewing skills.*

How can we improve our SUUPPRT activities?

*Maybe more social activities.*

*Any heavy schedule for the students should come earlier in the internship. As results are coming in, we need to be in the lab a lot more often.*



8. Were there enough opportunities for social interaction with other students, post-docs, and faculty? 3.7
9. How would you rate the general atmosphere/environment at the University of North Carolina at Chapel Hill? 4.3
10. Overall, how do you rate the UNC SUUPPRT Program? 4.5

## II. Educational aspects of the Program .

11. Do you feel you learned how scientific research is conducted? 4.3
12. Did you learn skills such as organizing your work/time and presenting your results? 4.6
13. Did you have adequate contact with your faculty preceptor? 4.3
14. Was the level of supervision satisfactory? 4.3
15. Do you feel you were adequately trained to use the equipment and/or experimental protocols necessary for your project? 4.3
16. Was your research project intellectually stimulating? 4.6
17. Were you an active participant in your project, i.e., were you able to make decisions, suggestions, work independently, etc. 4.3
18. Were others in the lab helpful? 5.0
19. Do you feel that your ability to work in a research lab was improved as a result of your summer experience? 4.3
20. Overall, how satisfied were you with your research experience? 4.3
21. What was your goal for the summer when you arrived at the UNC-CH SUUPPRT? Did you achieve that goal? What does success in the SUUPPRT program look like to you now?

*To network and learn as much as I can about prostate cancer. Yes. Success assures me I will like research in graduate school.*

*My goal for the summer was to gain as much experience as possible. I definitely achieved that goal. Success in this program has made me want to do more research and made me think about going to graduate school.*

### **III. Your career plans**

1. Have you participated in a summer program in addition to SUUPPRT? If so, where?

*2 students had previously participated in summer research programs, both at UNC-CH*

2. Was your understanding of the nature of post-graduate professional training enhanced by participation in SUUPPRT? 4.3

3. Do you feel that participation in SUUPPRT and/or another similar program has better prepared you for making a career choice? 4.6

4. What do you consider to be your primary career objective?

*Unsure.*

*Medical school or graduate school.*

*Graduate school.*

*Graduate school.*